Development of a Comprehensive Coverage Assessment Tool

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Abstract

BBN has been tasked with developing a comprehensive coverage assessment tool for ocean acoustic monitoring. This tool will facilitate studies into the issues and sensitivities of using acoustic assets in the ocean to support a Comprehensive Test Ban Treaty. These issues include 1) understanding the sensitivity of signal structure to ocean environment variability as manifested through modal coupling, bottom and surface interaction losses and horizontal refraction and diffraction, 2) understanding the sensitivity of signal structure to source characteristics, and 3) designing detection and localization strategies which exploit the the fullest extent our understanding of the source and propagation characteristics.

In the first phase of this effort, the coverage assessment tool, which couples global and basin scale acoustic propagation models together with compatible source functions and an ocean database library, will be developed and benchmarked against available data. Once validated, the tool will be exercised to predict the signal and noise characteristics at existing and notional receiver locations, in order to identify regions where detection will yield particular challenges. Features of this tool will be software modularity and extensibility in order to facilitate the incorporation of new source functions, propagation models, databases and performance assessment modules as they become available.

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